pressure in the hand and thereby exaggerate the difference between the systolic congestion and diastolic anæmia which take place in its vessels. This capillary pulse is well marked in slight forms of anæmia and chlorosis and also in cases of aortic insufficiency. Quincke observed a venous pulse in the veins on the back of his hand when they were subjected to a high temperature; he also noticed it in the victims of aortic insufficiency. It was present in the veins of the hand of a woman who had slight hypertrophy of the left ventricle, and in a man who, owing to fracture of the vertebra and injury of the spinal cord appeared to have palsy of vaso-motor nerves.

4. *Influence of Chloroform upon the Temperature of the Body and the Circulation of the Blood.*—A paper presenting an account of Dr. J. Scheinesson's investigations on this subject is contained in the *Archiv der Heilkunde* of Leipzig, running through the first three numbers for 1869. The following are Dr. S.'s general conclusions:—

1. The diminution of temperature in the bodies of those who are under the influence of chloroform is the result of a decrease in the activity of the nutritive process, and consequently of a direct diminution in the heat producing function.
2. The insensible perspiration by the skin is evidently diminished.
3. When a rabbit is placed under the influence of chloroform the tone of the vessels of its ear will become diminished by the action of the chloroform upon their nervous centre.
4. Under the influence of chloroform the action of the heart is evidently weakened by the paralyzing action of the latter upon the muscular motive apparatus of the organ.
5. The slowness observed to occur in the metamorphosis of tissue, and the consequent reduction of temperature observed in the bodies of those who have been subjected to the narcotism of chloroform, are due evidently to the slowness with which the blood circulates, because of the crippled propulsive power of the heart. D. F. C.

5. *Physiological Action of Picrotoxin.*—Dr. Hermann Roeber has instituted experiments to determine the physiological action of *picrotoxin*, the better crystalline principle contained in the kernel of the fruit of the *anamirta cocculus.* The general conclusion arrived at by the author is, that picrotoxin is a powerful *stimulant* of the *medulla oblongata*, and of all the nervous centres in it. Violent and continuous excitement of these produces convulsion of the muscles, by irritation of the vagus centre, retardation, and in the frog stoppage of the heart; indirectly, increased respiration which is ultimately hindered by cramp of the glottis and of the diaphragm. By irritation of Setschenow's inhibition centre, reflex susceptibility in the frog is for a time lowered; and, finally, the poison acts directly to a small extent upon the motor-nerve-centres of the heart.

Though hardly used therapeutically at all, it is of interest to add to those we already know another substance which will act specially upon so limited but so important a portion of the nervous system.—*Glasgow Med. Journ.*, May, 1869, from *Reichert's Archiv für Anat. Phys. und Wissenschaftliche*, Pt. I. 1869.

MATERIA MEDICA, GENERAL THERAPEUTICS AND PHARMACY.

6. *Report of the Edinburgh Committee on the Action of Mercury, Podophylline, and Taraxacum, on the Biliary Secretion.*—The *British Medical Journal* (May 8, 1869) contains the concluding portion of the highly interesting and important report of the Edinburgh Committee, made through their reporter, Dr. John Hughes Bennet, on the action of mercury, podophylline, and taraxacum, on the biliary secretion. The inquiries instituted by this committee occu-

pied two years, and the committee believe them to be quite exhaustive, and to leave nothing to be desired.

The mode of operating for biliary fistulæ, and of collecting the bile is first described. "All the operations were performed by Dr. W. Rutherford, who ultimately succeeded in overcoming the great difficulties which presented themselves. The collection of the bile for a period of at least twenty-four hours at a time was considered incumbent, to insure accuracy and to avoid error. The proceeding caused much trouble, and was attended with frequent failures; it was considered necessary, however, in order to avoid the obvious fallacies into which all previous experimenters, with the exception of Dr. Scott, had fallen."

We omit these details, as they would be chiefly interesting to the few who may desire to repeat the experiments, and they will refer to the original report.

The committee had not proceeded far with their experiments, before it became evident that a preliminary investigation was necessary, in order to *determine how far dogs are capable of being influenced by mercurials.* Accordingly a number of experiments were instituted to determine this question, and the results showed that on the dog mercury has the same action as it exerts on man.

"During the two years over which the committee's inquiries extended, forty-one dogs were subjected to the operation for establishing a biliary fistula. Of these, four died during its performance from the effects of chloroform. In four others the operation was not proceeded with after opening the peritoneum, in consequence of the impossibility of bringing the fundus of the gall-bladder into contact with the abdominal wall. The operation was completed in thirty-three cases; but from various causes, which the committee consider it unnecessary to detail minutely, satisfactory observations could only be carried on in nine dogs. These have been numbered consecutively from one to nine, but it has been thought better to arrange the numerous observations made upon them according to the preparation of mercury employed."[1]

We omit the details of the experiments of the committee on several dogs in which biliary fistulæ were established, to determine the cholagogue action of pilula hydrargyri and calomel, and quote the results which were arrived at, and which are stated to be:—

"1. Pilula hydrargyri, when given in doses which did not produce purgation, caused no increase of the biliary secretion.

"2. Pilula hydrargyri, when given in doses which produce purgation, diminished the biliary secretion.

"3. Calomel, given in doses of one-twelfth of a grain, from six to fourteen times a day, and in doses of two grains from two to six times a day, did not produce purgation or increase the biliary secretion.

"4. Calomel, when given in doses which produced purgation, diminished the biliary secretion."

Next experiments were made on dogs with biliary fistulæ, to determine the cholagogue action of corrosive sublimate, and the results are stated to be the following:—

"1. That corrosive sublimate, when given in small doses, gradually increased in strength, does not augment the biliary secretion, but that it diminishes it the moment the dose reaches a strength sufficient to deteriorate the general health.

"2. That corrosive sublimate given in the above method may diminish the biliary secretion, while it does or does not produce an evident action on the salivary glands and mouth, and without producing purgation.

"3. Case 6 shows that the biliary secretion is likewise diminished when this drug is given in a dose sufficient to produce purgation."

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[1] The daily results of each series of observations are recorded in tables, giving (1) the date; (2) the weight of the dog; (3) the amount of food—water, bread, milk, and meat; (4) the quantity of fluid bile, bile-solids, and bile-salts, secreted in twenty-four hours; (5 and 6) the amount of fluid bile, bile-solids, and bile-salts, secreted in proportion to each *kilogramme* of the animal and to each 100 *grammes* of dry food. In columns 5 and 6, the estimates are made on the days when the maximum and minimum quantities of bile were secreted; and the average quantities given at the foot of these columns are estimated from the average quantities of columns 2, 3, and 4.

The next subject which engaged the attention of the committee was the mode in which the mercury caused a diminution of the biliary secretion in dogs. The legitimate conclusion from this experiment, the committee state, "seems to be that mercury, when administered so as to impair the general nutrition, lessens the biliary secretion. This may result without impairment of the appetite; but, when there is a diminished consumption of food, the failure in the biliary secretion is all the more marked."

The committee give the following as their conclusions regarding the cholagogue action of mercury:—

"The foregoing observations seem to us clearly to show that blue pill, calomel, and corrosive sublimate, when given to dogs in either small, gradually augmented, or in large doses, do not increase the biliary secretion; they do not even influence it so long as neither purgation nor impairment of health are produced, but they diminish it as soon as they produce either or both. It may be urged that, although we have proved this regarding dogs, it does not follow that on man these drugs will have the same action. It must be admitted that some animals are altogether insensible to remedies which produce powerful effects on others; that different doses are often requisite to occasion similar results; and that there may be peculiarities so very decided as to render it impossible to infer what will be the action of a remedy on one animal from its influence upon another. But have we any reason to conclude that in the present instance there exists such difference in the action of mercury as to prevent any inference being drawn from the dog regarding man? All the facts with which we are acquainted show that it is legitimate to infer that the action of mercury ought to be regarded as similar in both cases. We have demonstrated that, as regards its action upon the salivary glands, mouth, intestine, appetite, and general nutrition, the influence of mercury is the same. We therefore infer that it is in the highest degree probable that its action on the hepatic secretion will also be the same. The only difference that there seems to be between the dog and man as regards the action of mercury, consists in the fact that in the dog larger doses are generally required to produce the same effects as those observed in man. But even here it may be argued that more marked results are required to satisfy the observer, and hence the greater dose necessary. These circumstances, therefore, cannot be held as affecting the conclusion at which we have arrived.

"We have not deemed it worth our while to experiment upon any other animal, for we are unable to see how such experiments could materially strengthen our position. Even though we had shown that mercury, when given to a rabbit, cat, pig, donkey, or horse, diminishes the biliary secretion, it might still be said that this does not apply to man. But there are several special reasons which render experiments on these animals either impracticable or less reliable than those on the dog. Bidder and Schmidt failed to establish biliary fistulæ in cats; we therefore thought it not worth our while to spend money and time in making the attempt. Horses and donkeys are too unwieldy for the purpose, and have no gall-bladders, a peculiarity which in all probability would render it impossible to establish biliary fistulæ in them. In pigs, the hepatic secretion differs from that of man, inasmuch as it contains hyocholic acid, and, according to Strecker, no sulphur. It might, therefore, not unfairly be objected to any inferences from experiments on pigs, that, inasmuch as the porcine differs from the human hepatic secretion, it could not be held as altogether probable that mercury would influence both in the same way. Everything seems to show that the animals used by the committee are those best suited for the observations they have made. In addition to the therapeutical facts previously mentioned, which, after all, are the most important, there are these, that the qualitative composition of canine is the same as that of human bile, and that the dog, like man, can be fed on a flesh, vegetable, or mixed diet. In this respect dogs are superior to most other animals, even to the Quadrumana, which, though in conformation most resembling man, are vegetable feeders. So far, therefore, as direct experiment and exact observations are capable of determining the influence of mercury upon the biliary secretion, the committee have no doubt that the dog is superior to the animals above mentioned.

"But it may be supposed that mercurials possess some specific power of exciting the biliary secretion by acting on the orifice of the common bile-duct, and so stimulating the secretion through the nerves which connect it with the liver, just as pyrethrum and vinegar stimulate the salivary glands when they are applied to the orifices of the salivary ducts. It might also be objected that, inasmuch as in our experiments the common bile-duct had been divided, the nerves alluded to might have been so injured that stimulation of the orifice of the common bile-duct could no longer excite the secretion. It remains to be shown, however, that mercurials do specially excite the orifice of the bile-duct. It is not probable, at any rate, that their influence on the biliary secretion was, in the case of dogs 6, 7, and 8, prevented by division of hepatic nerves. In these experiments the common bile-duct was simply divided with as little injury to neighbouring parts as possible (in previous experiments a portion of the bile-duct was removed), and these animals did not suffer in the least from shock after the operation; so that nervous injury could not have been extensive. Moreover, in the case of dog 7, the parts around the common bile-duct were dissected after death, and the nerves proceeding from the solar plexus to the liver were found at some distance from the duct, and had apparently suffered no injury at the place where it had been divided. The committee, therefore, do not attach any value to this objection.

"But some may say that, although we have proved that mercury diminishes the biliary secretion in dogs, and that in man its action will in all probability be the same, yet our experiments have been performed on animals in a state of health; and that, had they been made on dogs with diseases such as those in which mercury has been *supposed* to increase the hepatic secretion, it would possibly, in the case of such dogs, have been increased. With such an hypothesis we need not seriously occupy ourselves until the objectors *prove* that, in any case whatever, mercury can increase the biliary secretion in man.

"We have been unable to discover any facts brought to light in this or any other age which prove that mercury stimulates the biliary secretion. So far as we can make out, the notion that it does so originates in some vague statement made by Paracelsus,[1] or the authors of his time, as to the good effects of mercury in what he has called "icteritia." But we repeat, not only do we not know how such a notion has arisen, but we are ignorant how to make direct observations on the subject in man. We have already stated that such observations are, in the present state of physiological chemistry, impossible. We do not deny the possibility of mercury being useful in some diseases of the liver. We simply say that the notion of its doing good by increasing the biliary secretion is untenable."

Before concluding the observations on dogs with biliary fistulæ, the committee thought it would be important to try the cholagogue influence on the liver of podophylline and extract of taraxacum, and the following are given as the results of their observations:—

"1. Doses of podophylline, varying from 2 to 8 grains, when given to dogs, diminished the solid constituents of the bile, whether they produced purgation or not.

"2. Doses which produced purgation lessened both the fluid and solid constituents.

"3. During an attack of dysentery, both the fluid and solid constituents of the bile were greatly lowered.

"4. Doses of the solid extract of taraxacum, varying from 60 to 240 grains, affected neither the biliary secretion, the bowels, nor the general health of the animal."

The observations of the committee conclusively show *that purgation produced by a variety of causes diminished both the fluid and the solid constituents of the biliary secretion.* "Spontaneous diarrhœa, dysentery, purgation produced by pilula hydrargyri, by calomel, by corrosive sublimate, and by podophylline, always diminished the solid constituents of the bile, and, with one exception, the fluid portion of the bile also. That purgation diminishes the biliary function of the liver, is one of the most important facts established by the committee. It is, however, nothing more than what might have been expected, seeing that purgation drains the portal blood, from which the bile is almost entirely formed."

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[1] Paracelsus (Aur. Phil. Theoph.), Opera Medico-Chemica, 3 tom. 4to., Francof., 1603–1605.—*De Icteritiis*, vol. i. p. 329.

The relation between the biliary secretion and the amount of food consumed is shown by the observations of the committee to be by no means so close a one as "Bidder, Schmidt, Arnold, and others have supposed. On looking at the collections of bile in the healthy animal previous to the administration of drugs, it will frequently be seen that, while eating the same food, and without there being any apparent disturbing cause, such as diarrhœa, etc., the amount of bile was nearly a half and even four-fifths less than on previous and subsequent days, Further, it was frequently observed that, although the amount of food consumed varied greatly, the secretion of bile was remarkably constant." The biliary secretion is in some cases greatly influenced by the amount of food taken, while in others it is not. The amount of bile secreted was greatly diminished by starvation.

The *close relation* supposed to exist *between the amount of the biliary secretion and weight of the animal* has not been supported by the observations of the committee. The amount of bile secreted for every kilogramme weight of dog, varied greatly in different cases.

With regard to the *effect of the loss of bile upon the health of the animal*, the committee state that "although an animal may live in perfect health for a considerable time without any bile passing into its alimentary canal, it would appear from the observations of all who have experimented on the subject, that, even when a fistula has been established without accident, the health sooner or later begins to suffer. Emaciation comes on, and death results from inanition. Much depends on the strength of the animals, which, when vigorous, usually preserve their health."

As regards the *effect of muscular movements upon the flow of bile*, the committee state, "It was frequently observed that, when the dogs were taken out of their cages, in which their movements were much circumscribed, and allowed to run about, during the first half hour or so of their increased movement, the amount of bile discharged by the fistula was greatly augmented. This was, in all probability, due to the bile being more rapidly expelled from the hepatic ducts by the pressure upon the liver of the contracting abdominal muscles, which must, when in action, compress the liver like a sponge, and so expel its contained fluid. This fact is valuable in serving to show that exercise may have an important influence upon the liver. It further points out, however, how utterly fallacious must the results have been, had we endeavoured to estimate the daily secretion of bile from collections made during a few minutes at a time, such as were made by Bidder and Schmidt; regarding which, however, we have previously expressed our opinion."

The committee conclude their report with the following remarks:—

"It is unnecessary to dwell upon the importance of the results at which the committee have taken so much pains to arrive. If the refutation of a widespread error be as important as the establishment of a new truth, the practical advantage of demonstrating that mercury is not a cholagogue cannot be too highly estimated. Although, in recent times, the administration of mercurials for hepatic diseases has greatly diminished, their employment is still very general, and in India almost universal. Recent cases demonstrate that long-continued salivation and great loss of health have been produced in the attempt to remove old abscesses or other chronic diseases of this organ, and there are few of its lesions in which it is still not thought advisable to try small or full doses of the drug.

"On this subject it is unnecessary to dwell at present. The real question is, whether the evidence is satisfactory, or whether further researches are necessary. On this and many other topics connected with therapeutics, what we require are not unfounded assumptions and vague speculations, but positive knowledge, based on unquestionable data. These we have furnished, and consider them amply sufficient to demonstrate the fallacy of the opinion everywhere prevalent as to the cholagogue action of mercury."

7. *Action of Sulphurous Acid in reducing Temperature.*—Dr. ROBERT BIRD publishes a note stating that he has recently used sulphurous acid in cases where the temperature of the body was abnormally high, with a happy result. A fall in the measured heat of the tissues has almost always followed its administration continued over twenty-four hours. In several cases of remittent fever where ammonia and sulphuric ether had failed to cool the body, sulphurous acid succeeded. He usually gives it in drachm doses every two, three, or four hours, according to the intensity of the heat; the greater the heat the more frequent the repetition of the dose. In remittent fever it is specially beneficial, and in many instances in that condition of the body named by the natives internal fever. He does not regard it as a panacea for every form of diseased action, but it is a valuable addition to the list of those remedies which control animal heat. He was at first led to use it therapeutically, from finding that it had been given a high place in a list of substances powerful to absorb radiant heat. In this list sulphuric ether and ammonia take high places; but sulphurous acid takes a higher place still. It can scarcely be otherwise than that the substance, which has the power to absorb radiant heat in a shut chamber, should also have the power to absorb it when present amongst the bodily tissues. At any rate, it is not a little remarkable that ammonia, sulphuric ether, and sulphurous acid, which are large absorbers of radiant heat, are also powerful febrifuges, and that quinia, our most powerful antiperiodic, is at the same time one of the few known substances which can render the chemical rays in the spectrum luminous.—*Practitioner*, April, 1869, from *Indian Med. Gazette*, February.

8. *Action and Therapeutical Uses of Bromine and its Preparations.*—Dr. H. PLETZER has employed the bromide of potassium in twenty-five cases of epilepsy or epileptiform affections, and has drawn certain conclusions to the following effect as to its operation. The energy of the heart's impulse diminishes, and the frequency of the beats is lowered, the number of pulsations being generally reduced to 50. Depression of spirits, exhibited by sleepiness, giddiness, want of memory, and weakness of mind, was unmistakable; but it disappeared on the discontinuance of the drug, or the diminution of the doses. Whether these effects are exclusively due to the bromide, or are common to other salts of potassium, must be determined by future researches. In the motor system large doses caused more or less incapability of spontaneous movements, or a disinclination for it. The motor nerves of the spinal cord appear to experience a paralyzing influence from the bromide. Dr. Pletzer found the temperature in two cases sink one or two degrees. He never observed any appearance of gastro-enteritis, but often slight gastric catarrh and tendency to diarrhœa. In other cases, in spite of one to two-drachm doses, there was obstinate constipation. Sneezing and slight catarrh of the upper air-passages occurred in some cases, and slight dyspnœa in others, after doses of one or two scruples. The beneficial operation of the bromide in abnormal excitability of the generative organs is unquestionable. In opposition to other observers, Dr. Pletzer has but seldom found the urine to be increased; and even where it was increased, he has not always found albumen present. The recommendation of the bromide in diphtheria is unsupported by any valid proof; but as a remedy for convulsive affections and increased reflex irritability it surpasses all other drugs.

Dr. OZANAM, in a treatise "On the Employment of Solvent and Disaggregating Remedies in Pseudo-membranous Exudations," recommends bromine in such cases; and he ascribes to this drug, in opposition to the opinion of Pletzer, very successful results. He has made a number of experiments to show the action of different solutions on false membranes, when removed from the body; and, according to his results, it appears that, with the exception of the ammoniacal oxide of copper, which holds the first rank, the alkaline preparations are preferable to the acid ones in pseudo-membranous exudations, and that bromide of potassium stands nearly at the head of the list, being inferior only to phosphate of soda and chlorate of potassa, which last has so long been considered the most efficacious. If remedies are sought for their "disaggregating" properties, the series will be as follows: Chloride of bromine, bromine, and chlorine; then iodine, chloride of iron, corrosive sublimate, and chromium. Dr. Ozanam prefers bromine to all other remedies, because, like bromide of potassium, it has at the same time an influence over the mucous membrane of the throat, uvula, and the larynx; and, like chlorine, has the power of destroying contagion. For internal use, a watery solution should be employed, in the proportion of one drop to twenty-five or thirty grammes, and of this solution one or two grammes should be given every hour. Fumigations of bromine may also be used in croup; and Dr. Ozanam thinks that very successful results have followed this treatment, and that the extension of epidemics of croup have been prevented by its adoption.—*Brit. and For. Med.-Chir. Rev.*, April, 1869, from *Schmidt's Jahrbücher*, Aug. 27, 1868.

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9. *Physiological Action of Bromide of Potassium.*—To the numerous recent investigations on bromide of potassium Dr. F. A. Saison contributes an additional one of considerable merit and interest (*Du Bromure de Potassium et de son Antagonisme avec la Strychnine*, Paris, 1868). His experiments on the lower animals point out that two principal and dominant actions are always produced by large doses of this salt: diminution of cerebral activity and impairment of motion followed by paralysis. The paralysis is due to an action on the spinal cord and on afferent and efferent nerves, and not to one on muscles. Saison appears to consider, in opposition to several previous observers, that the afferent (sensory) nerves are not always paralyzed at an early stage in the poisoning; but that, sometimes, they retain their conductivity even until a few seconds before death. The heart escapes the poisonous action entirely. He agrees with previous observers in maintaining that the sympathetic nerve-system is powerfully affected, the vascular nerves being so energetically stimulated that the minute bloodvessels are often contracted to such a degree as to become completely closed. The action both on the central nerve-organs and on the nerves themselves (periphery) may be explained by this effect on the bloodvessels; interference with nutrition consequent on contraction of bloodvessels being in both cases the cause of paralysis. Saison has also studied the physiological action of bromide of potassium on man; and this portion of his brochure is of special interest to the physician. The *motor nerve-system* is always the first to be affected, and while, in many cases, weakness merely may be produced, in others there may be almost absolute loss of motor power. The effects on *sensibility* are less constant, and no instance of complete anæsthesia appears to have been met with by any observer. *Cerebral activity* is impaired almost as promptly and invariably as motricity; and like that of the latter this impairment is met in very varying degrees, from slight feebleness of intellectual activity even to idiocy. Somnolence is very constantly produced both by large and small doses; and after the latter, many observers have described various cerebral effects of a more serious character. The principal effects that are produced by large doses on the *special senses* are slight blindness, with, occasionally, temporary amblyopia, and diminution in the acuteness of hearing or even decided deafness: but even these are comparatively rare effects. Numerous observations exist to prove that the *generative function* is weakened or even rendered impossible by this salt. This inconvenience usually disappears soon after the administration is stopped, but sometimes it remains long afterwards. Epileptics seem able to take large quantities without any impairment in their genital functions. In the majority of cases the *heart* is unaffected, and where any change is observed it invariably consists of a diminution in the number of the contractions, and frequently also of an improvement in the regularity of the heart's action. The *temperature* is scarcely ever affected, and when it is an extremely slight diminution is observed. The *minute bloodvessels* are always contracted, and the peripheral circulation thereby diminished. Saison attributes the emaciation, which is sometimes produced after a long-continued administration, to this influence on the circulation. The *respiratory movements* are but little affected in man. The *secretions* are very slightly influenced. That of the kidneys is some-

what augmented; that of the salivary glands neither increased nor diminished; and that of the sebaceous glands faintly diminished. On the *digestive system* several marked effects are observed: the appetite is increased, and constipation is always produced. In conclusion, all the functions that are under the control of the sympathetic system are modified in accordance with an excitation of that system, and those under the control of the cerebro-spinal in accordance with a diminution in its activity.

Dr. Saison believes that strychnia is the substance which has the strongest claims to be regarded as the antagonistic in action to bromide of potassium. The former, he asserts, dilates bloodvessels, and in this way increases the excitability of the reflex centres; the latter contracts bloodvessels, and thus diminishes this excitability. His experiments have demonstrated that strychnia convulsions may be impeded in their manifestation and lessened in their violence by the bromide. The antagonism is not, however, a perfect one; for, while bromide of potassium diminishes cerebral activity, strychnia has no influence whatever on the brain.—*Journal Anat. and Phys.*, May, 1869.

10. *Physiological Action of Morphia.*—In reviewing the facts ascertained, in a somewhat fragmentary investigation into the physiological action of morphia, Dr. Gscheidlen (*Untersuchungen aus dem physiologischen Laborotorium in Würzburg*, Drittes Heft, 1868) states his results in the following manner: 1. Morphia, in small doses, elevates the excitability of the motor nerves of muscles; and in larger doses it diminishes this excitability. 2. Acetate of morphia at first increases the excitability of the sensory nerves (1 and 2 refer specially to frogs). 3. Acetate of morphia acts by first stimulating, and, then, abolishing the functions of all the nerves that influence the circulation. 4. It at once lowers the activity of the respiratory centres in the *medulla oblongata.* 5. In small doses, it at first elevates the temperature of the body; in toxic doses, it at once lowers it. 6. It does not affect the striped muscles. Gscheidlen concludes his paper by pointing out that this investigation does not include all the actions of morphia, and by promising to overtake the many points that have been omitted on some future occasion.—*Ibid.*

11. *Physiological Action of Papaverine.*—The recent researches of Dr. HOFMANN (*Wiener Wochens.* xviii. 58, 59, 1868) contradict the statement of Dr. Leidesdorf that papaverine acts as a narcotic and soporific, and produces muscular relaxation. Dr. H., in the first place, subjected himself to some experiments with hydrochlorate of papaverine. He took, on three successive days, doses of 1.8, 3.7, and 5.5 grains, but after the first two doses no distinct symptom was observed. About an hour and a half after the third dose, he suffered from severe hiccup, which disappeared in six minutes, and was followed by epigastric pain; and, on the disappearance of this, he experienced acute frontal headache, without any sensation of muscular relaxation or weakness. He thus collects together the results of his numerous experiments with this salt: 1. Papaverine occupies an extremely low position as a narcotic, for every other narcotic alkaloid produces decided hypnotic symptoms when given in so large a dose as five and a half grains. 2. This dose of papaverine, however, does not cause the slightest hypnotic symptom. 3. Papaverine does not cause muscular relaxation. 4. Its effects are not cumulative, for when administered, during several days, in successively increasing doses, it produces neither sleep nor muscular relaxation. 5. Papaverine has no action on the pulse, respirations, nor animal temperature. 6. It does not produce constipation; nor has it any influence on the excretion of urine, neither its total quantity nor the quantity of the urea it contains being increased.[1]—*Ibid.*

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[1] The investigations on papaverine resemble those on several of the other active principles of opium in the great discrepancy of the results of different investigators. The explanation of this is probably to be found in the impurity of these alkaloids, even when obtained from some of the best manufacturers, their separation having been imperfectly effected, so that one principle frequently contains a notable admixture of another.—F.

12. *Hypodermic Injection of Morphia.*—Mr. A. **Evershed** states (*Medical Times and Gaz.*, May 1, 1869), that this method of medication is less frequently employed than it should be. "It is especially," he says, "in cases of neuralgia that this method of administering sedatives exhibits to most advantage. The effect of a small dose of acetate or hydrochlorate of morphia—*i. e.*, from $\frac{1}{8}$th to $\frac{1}{4}$th of a grain—in a case of facial neuralgia, for instance, injected beneath the skin of the forearm into the areolar tissue, is sometimes almost marvellous; usually within ten minutes the patient is quite free from pain, often giving expression to his feelings thus: 'I am quite comfortable, and free from any pain.' The effect of one such dose is startling to any one who has not had some experience in these cases; the beneficial influence continues for several hours, and in ordinary cases not arising from organic disease, a few injections will suffice to effect a cure.

"It is exceedingly useful in almost all cases attended with local pain, and in many cases of wakefulness—*e. g.*, delirium tremens.

"It is a remarkable fact that morphia thus used has a more permanent effect in allaying pain than when given in any other way.

"After a fracture has been reduced, and the limb placed in proper position, a small dose of morphia injected into the areolar tissue of the limb is of great value in preventing muscular spasm, and, I think, ought scarcely ever to be omitted."

13. *Employment of Phosphide of Zinc in Medicine.*—M. **Vigier** and Dr. **Curie** have recommended the use of phosphide of zinc in cases where the administration of phosphorus is indicated. The substance is a gray crystallized body, perfectly definite in composition, unaltered by moist air, and keeping well, either in powder or in pills; but nevertheless easily decomposed in the stomach, and capable of exercising an action on the system identical with that produced by phosphorized oil. Phosphide of zinc is selected in preference to the other metallic phosphides, because it is at once perfectly stable, and easily decomposed by weak acids. Even lactic acid attacks it, evolving phosphoretted hydrogen; according to Messrs. Vigier and Curie this explains the action which occurs in the stomach. Phosphide of zinc is prepared by passing the vapour of phosphorus over zinc heated to ebullition, in a current of dry hydrogen.

The authors administer it in doses of one milligramme (0.015 grain) several times a day. It is given either in the form of pilules or of powder.—*Medical Press and Circular*, April 28, 1869.

14. *Prevention of Pain from Blisters.*—M. **Bricheteau** states that he has found the hypodermic injection of from 5 to 10 drops of a solution of hydrochlorate of morphia (1 part to 50 of water), executed immediately before applying the blister, a most excellent procedure. When the blister is good it begins to rise in from three to five hours, and, as the effect of the morphia lasts for six or eight hours, all pain is prevented during the process. In some persons, whose skins resist a blister more than ordinarily, the injection may be delayed for an hour after its application. By this means when a blister is applied at night, the patient, so far as it is concerned, may still enjoy his night's rest; and sensitive persons are saved much suffering, for example, in the case of the application of blisters to the hypogastric region in young women. The dressing a blister also requires attention. No greasy substance should be applied; but having left as much of the raised epidermis intact as possible, this should be emptied of its serum by a broad clip with scissors, and, after it has sunk down again on the dermis, a thick layer of wadding should be applied. This is to be left on for two days, no other dressing being required. Cicatrization may also be hastened by the following contrivance: Cut a good-sized hole in the centre of the blister before applying it, and this central untouched portion greatly expedites the healing of the denuded zone which surrounded it.—*Ibid.*, from *Bull. de Thérap.*

15. *Ferric Iodate and its Therapeutic Properties.*—Dr. **Charles A. Cameron** suggests (*Dublin Quarterly Journ. of Med. Sc.*, May, 1869) the employment of

the ferric oxide (iodate of the sesquioxide of iron) as a substitute for iodide of iron. The following is his description of the preparation, composition, and physical properties of this body:—

There are two iodates of iron—ferrous (iodate of protoxide of iron), and ferric (iodate of per or sesquioxide of iron). The ferrous iodate is an unstable compound, but the ferric iodate does not readily undergo decomposition. On mixing iodate of sodium ($NaIO_3$ or $NaO.IO_5$, old notation) with an ammoniacal solution of ferric sulphate (sulphate of the peroxide of iron) a yellowish precipitate of ferric iodate takes place. The formula of this precipitate appears to be as follows: $Fe_2O_3,2I_2O_5.8H_2O$. It is, therefore, a basic salt, containing 51 per cent. of iodine and 11 per cent. of iron.

Ferric iodate is a fine yellowish red powder, closely resembling Turkey rhubarb in appearance. It is nearly insoluble in water, and is decomposed by hydrochloric acid, with the evolution of chlorine. It dissolves in nitric acid and sulphuric acid without evolving any odour, and forms with those fluids a colourless solution. If carefully prepared it is inodorous, but is likely to possess a very faint odour of iodine. It is very nearly tasteless. At the temperature of boiling water it remains long unchanged; nor has the atmosphere any effect upon it.

The crystallized protiodide of the Pharmacopœia contains 63½ per cent. of iodine and 13½ per cent. of iron; its formula being $FeI_2 5H_2O$. It is therefore richer in iron and iodine than the ferric iodate, but in the two salts the same relative proportions of iron and iodine exist.

As a substitute for iodide of iron, Dr. Cameron claims for the iodate of iron the following advantages: In the first place, it possesses a stability of composition, the want of which is so serious a disadvantage in the case of iodide of iron. Secondly, it is a preparation capable of easy administration, being nearly tasteless, and producing no discoloration of the teeth. I have known many cases where patients exhibited so great a distaste to the acrid iodide of iron that they could not take it in any form. It is probable that *iodism* is produced more frequently by the use of the ferrous iodide than by the alkaline iodides. Thirdly, whatever medicinal virtues are possessed by the chlorates, so far as their oxygen is concerned, are in all probability also to be found in the iodates, which they so closely resemble. The only difference between common culinary salt and chlorate of sodium (chlorate of soda) is the existence of a large quantity of oxygen in the latter. There is the same difference between the chloride of potassium and the chlorate of that metal. In addition to the powerful properties which it derives from its iron and iodine, ferric iodate also possesses the advantage of having a large percentage of "condensed" oxygen. If, as Dr. O'Dwyer states to be the case, chlorate of potassium modifies the action of mercury upon the system, and prevents it from running riot, iodate of iron might have the same effect. In syphilitic affections it would be worth trying whether the iodate of iron might not with advantage be alternated with the mercurial preparations when it is found necessary to employ the latter.

I have not the opportunity of determining the relative merits of the sesquiiodate of iron *versus* iodide of iron or the iodide of potassium in actual practice; some of my medical friends have, however, undertaken the experiment, and so far, they report favourably of the iodate. A member of my own family, who could never tolerate in any form the iodide of iron, is now taking pills composed of three grains of iodate of iron and two grains of extract of hyoscyamus.

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15. *Waste in Fever.*—In the *Deutsches Archiv. fur Klinische Medicin* for March, 1869, is contained a long and very elaborate paper by Prof. E. LEYDEN, under the title of "Researches on Fever." From it we extract the following